Remarks

The Present Invention and the Pending Claims

The present invention relates generally to the delivery of true end-to-end application Quality of Service (QoS) over Internet Protocol (IP) networks.

Claims 1-18 are currently pending. Reconsideration and allowance of the pending claims is respectfully requested.

Summary of the Office Action

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al., (herein Lo) US Patent No. 6,798,786 in view of Krishnaswamy et al., (herein Krishnaswamy) US Patent No. 6,909,708.

Amendments To The Claims

Claims 1 and 10 are currently amended.

Claims 2 - 9, 11-18 are retained in their original form.

Claim 1 has been amended as shown on page 2 of this response.

Support for this amendment is found at paragraphs [0034], [0055] and [0094].

Claim 10 has been amended as shown on page 4 of this response. Support of this amendment is found at paragraphs [0055] and [0094].

The office action states: **"Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo (US Patent No. 6,798,786) in view of Krishnaswamy (US Patent No. 6,909,708). As to claim 1, Lo teaches the invention as claimed, including a method comprising: reserving a Quality of-service (QoS) resource pool at a predetermined portion of available bandwidth (see col.7, lines 37-52) co1.14, lines 16-27, col. 16, lines 20-26) between a first network device coupled in communication with a packet network and associated with a first user community and a second network device coupled in communication with the packet network and associated with a second user community (Fig. IB, terminal 14. . , 19, and 34) for real-time communication sessions among users of the first user community and the second user community (See col. 9, lines 50-67); and providing end-to-end application QoS between the first user community and the second user community by selectively admitting a plurality of real-time communication sessions between the first user community and tile second user community based upon currently available resources associated with the QOS resource pool (see col.7, lines 37-52, col. 14, lines 16-27, col.l6j lines 20-26) and the plurality of real-time communication between the first network device and the second network device (see coI.9, lines 50-67). But Lo does not explicitly teach multiplexing and reservation protocol session. However, Krishnaswamy teaches multiplexing (see col. 1 2, lines 20-25, col. 14, lines 62-67, coI.24, lines 15-25, and col. 190, lines 15-20) and reservation protocol session (see col. 87, lines 9- 15, col. 127, lines 1-1 7, RVP). It would have been obvious to one of ordinary skill in the art at the tinge of the invention was made to implement the teachings of Krishnaswamy into the computer system of Lo to have multiplexing and reservation protocol session because it would have provided specific functions that can combine multiple signals (analog or digital) for transmission over a common line or media over new Internet protocol being developed to enable the Internet to support specified Qualities of service."**

MPEP section 2142 states: "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in

the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the references or to combine the reference teachings. Second there must be a reasonable expectation of success. Finally, the prior art references (or references when combined) must teach or the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

In response to the above obviousness rejection, first, there is no suggestion or motivation in Lo, Krishnaswamy or in the knowledge generally available to one of ordinary skill in the art, that the process of setting bandwidth thresholds of Lo (sections col.7, lines 37-52, co1.14, lines 16-27, col. 16, lines 20-26 relied on by the Examiner) can be combined with a RSVP session and multiplexing process of Krishnaswamy to arrive at the steps of "reserving a Quality of-service (QoS) resource pool a predetermined portion of available bandwidth" and "providing end-to-end application QoS between the first user community and the second user community by … based upon currently available resources associated with the QOS resource pool and the plurality of real-time communication between the first network device and the second network device". It would not be obvious to one of ordinary skill in the art to implement a common RVSP session for a plurality of application sessions. Such an implementation would require the provision of proxy functionality that is not taught by Lo and Krishnaswamy. For the reasons stated above, applicant respectfully submits that claim 1 is not obvious over the cited references, and applicant solicits reconsideration of the rejection and allowance of claim 1.

Second, even if the teachings of Lo and Krishnaswamy are combined, the combination that results will be inoperable for the purpose intended by claim 1. By combining the teachings of Lo and Krishnaswamy, a multiplicity of individual RSVP sessions caused by the need for a RSVP session for each application will be multiplexed in a pipe with a bandwidth threshold. However, in the present invention, a common dynamic end-to-end QOS pipe is maintained between two different user communities

using a common preallocated RSVP session. The present invention enables scaling up of application sessions with QoS maintained through a single RSVP. In contrast, the prior art teaches away from the feasibility of providing QoS through RSVP by explicitly stating that scaling up is a significant limitation of the state of the prior art. For example, Krishnaswamy states in col. 87, line 13 to 15, "...but the need for the added complexity of RSVP is yet to be established. Also, questions remain regarding the scalability of RSVP for large scale Internet Telephony".

It would not be obvious to one of ordinary skill in the art to implement a common RVSP session for a plurality of application sessions. Such an implementation would require the provision of reservation protocol proxies which are not taught by either Lo or Krishnaswamy. In support, paragraph [0055] of the applicant's disclosure states: "According to one embodiment, the media aggregation managers 115 and 225 act as reservation protocol proxies on behalf of terminals 111, 112, 121 and 122. For example, the media aggregation managers 115 and 125 establish and maintain a reservation session, such as an RSVP session, between each other by exchanging reservation signaling messages 160. Subsequently, rather than establishing additional reservation protocol sessions, the media aggregation managers 115 and 125 respond to reservation requests from the terminals 111, 112, 121, and 122 by dynamically allocating the reserved resources, such as bandwidth, associated with the reservation protocol session to corresponding application sessions. In this manner, multiple application sessions may share the reservation session by multiplexing media packets onto the reservation session". Also, to reduce processing overhead, the multiplexing process of the applicants invention "hides the details of how reserved resources are internally allocated and managed, thereby allowing the local terminals to user existing reservation protocols, such as RSVP, without change (paragraph [0070])".

Third, even if the teachings of Lo and Krishnaswamy are combined, they do not teach or suggest the following limitations of claim 1:

-" reserving a Quality of Service (QoS) resource pool a predetermined portion of available bandwidth between a first reservation protocol proxy and a second reservation protocol proxy"; and

-" multiplexing the plurality of real-time communication sessions over a common reservation protocol session between the first network device and the second network device".

By combining the teachings of Lo and Krishnaswamy, a multiplicity of individual RSVP sessions caused by the need for a RSVP session for each application will be multiplexed in a pipe with a bandwidth threshold. However, in the present invention, a common dynamic end-to-end QOS pipe is maintained between two different user communities using a preallocated RSVP session.

The office action further states: **"Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo (US Patent No. 6,798,786) in view of Krishnaswamy (US Patent No. 6,909,708)."**

Claims 2, 3, 4, 5, 6, 7, 8 and 9 are dependent on claim 1, as amended. Since claim 1 as amended is not anticipated by Lo and Krishnaswamy, claims 2, 3, 4, 5, 6, 7, 8 and 9 that are dependent on claim 1 are also not anticipated by Lo and Krishnaswamy.

The office action further states: **"As to claim 10, Lo teaches the invention as claimed, including a method comprising: establishing an aggregated reservation protocol session over a path between a first device coupled to a public Internet Protocol (113) network and a second device coupled to the public IP network (Fig. 1B) (see col.7, lines 37-52, col. 14, lines 16-27, col. 16, lines 20-26); and providing end-to-end Quality of Service (QoS) on behalf of users of a distributed voice over IP environment by (i) selectively admitting a plurality of VOIP calls between those of the users associated with a first user community that access the public IP network via the first device and those of the users associated with a second user community that access the public IP network via the second device based on resources and a desired level of service (see col.7, lines 37-52, col. 14, lines l 6-27, col. 16, lines 20-26).**

But Lo does not explicitly teach multiplexing and reservation protocol session. However, Krishnaswamy teaches multiplexing (see col. 12, lines 20-25, col.14, lines 62-67, col. 24, lines 15-25, and col. 190, lines 1 5-20) and reservation protocol session (see col. 87, lines 9- l 5, co1. 127 lines 1- 17, RSVP). It would leave been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Krishnaswamy into the computer system of Lo to have multiplexing and reservation protocol session because it would clave provided specific functions that can combine multiple signals (analog or digital) for transmission over a common line or media over new Internet protocol being developed to effable the Internet to Support specified Qualities of service."

The arguments presented for the rejection of claim 1 are equally applicable to claim 10 as amended. Claim 10 has been amended to include reservation protocol proxies, and the amended section of claim 10 now recites:

> "establishing an aggregated reservation protocol session over a path between a first reservation protocol proxy and a second reservation protocol proxy, and a first device coupled to a public Internet Protocol (IP) network is represented by said first reservation protocol proxy and a second device coupled to the public IP network is represented by said second reservation protocol proxy."

The office action further states: **"As to claim 11, Lo teaches the invention as claimed, including a method comprising: establishing a first network device and a Second network device that are part of a geographically distributed enterprise voice over Internet Protocol (VoIP) network (see col. 10, lines 5-40),. receiving, at the first network device from a first local terminal, a request to initiate a first VOP call with a first remote terminal associated with the second network device (abstract), allocating a potion of pre-allocated resources associated to the first VoIP call between the first local terminal and the first remote terminal (See col. 10, lines 5-40); receiving at the first network device from a second local terminal, a request to initiate a second VoIP call with a second remote terminal associated with the second**

network device (fig.1B); allocating a portion of the pre-allocated resources associated the second VoIP call between the second local terminal and the second remote terminal (see col. 9, line 54 to col. 10, line 5, and col. 10, lines 5-40); and providing a desired level of Quality of Service (QoS) to both the first VOIP call and the second Vo1P call between the first VOIP call and the second VoIP call voice or voice-band data associated with the first and second VoIP calls (see col.4, lines 44-13, col. 14-24, col.6, lines 10-1 7, and col. 10, lines 33-43, col. 12, lines 19-54, and col. l3, line 65 to col. 14, line 53). But Lo does not explicitly teach multiplexing and reservation protocol session. However, Krishnaswamy teaches multiplexing (see col. 12, lines 20-25, col.14, lines 62-67, col.24, lines l5-25, and col. l 99, lines 15-20) and Resource Reservation Protocol (RSVP) session (see col.87, lines 9-15, col. l27, lines 1-1 7, RSVP). It would leave been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Krishnaswamy into the computer system of Lo to have multiplexing and Resource Reservation Protocol (RSVP) session because it would have provided specific functions that can combines multiple signals (analog or digital) for transmission over a common line or media over new Internet protocol being developed to enable the Internet to support specified Qualities of service.

The arguments presented for the rejection of claim 1 are applicable to the above rejection of claim 11. In addition, even if the teachings of Lo and Krishnaswamy are combined they do not teach or suggest the following limitation of claim 10: "providing a desired level of Quality of Service (QoS) to both the first VoIP call and the second VoIP call by sharing the RSVP session between the first VoIP call and the second VoIP call by multiplexing packets containing voice or voice-band data associated with the first and second VoIP calls onto the RSVP session." While Krishnaswamy discloses RSVP sessions, the applicant respectfully submits that there is no contemplation or suggestion in Krishnaswamy for providing a desired level of quality of service (QoS) by sharing a common RSVP session.

The office action further states: **"Claims 12-17 are rejected under 35 U.S.C.**

103(a) as being unpatentable over Lo (US Patent No. 6,798,786) in view of Krishnaswamy (US Patent No. 6,909,708)."

Claims 12, 13, 14, 15, 16 and 17 are dependent on claim 11. Since claim 11 is not anticipated by Lo and Krishnaswamy, claims 12, 13, 14, 15, 16 and 17 that are dependent on claim 11 are also not anticipated by Lo and Krishnaswamy.

The office action further states: **"As to claim 1 8, Lo teaches the invention as claimed, including a media aggregation manager comprising: a resource manager to establish a reservation protocol session with one or more other media aggregation managers prior to establishment of any application sessions that share resources associated with the reservation protocol and to subsequently allocate and deallocate the resources in response to application session establishment requests and application session terminations requests, respectively (see col. 13, line 44 to col. 14, line 28); an admission control manager coupled to the resource manager, the admission control manager to provide admission control for application flows based upon availability of the resources as indicated by the resource manager, a media coupled to the admission control manager, the media tag media packets received from local application/endpoints that are associated with admitted application flows and to transmit the tagged media packets over the reservation protocol session (see col.6, lines 10- 17, col.8, lines 33-43, and col.9, line 50 to col. 10, line 40; a media to forward media packets received from remote application/endpoints to the local application/endpoints based upon tags appended by a media of the one or more other media aggregation managers (see co1.3, lines 39-53, col.4, lines 28- 40, and co1.8, lines 32- 43)., and a signaling gateway to perform signaling/media translation, if necessary among a first signaling protocol employed by a first Voice over Internet Protocol (VoIP) environment in which time media aggregation manager is to operate and one or more signaling protocols employed by VoIP environments in which the one or more other media aggregation mangers operate (See co1 9, line 50 to col. 10, line 23). But Lo does not explicitly teach multiplexor, demultiplexor and reservation protocol session. However, Krishnaswamy teaches multiplexor,**

demultiplexor (see col. 12, lines 20-25, col. 14, lines 62-67, col. 24, lines 15-25, and col. 190, lines 15-20) and reservation protocol session (see col. 87, lines 9-15, col. 127, lines 1-17, RSVP). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Krishnaswamy into the compacter system of Lo to have multiplexing and reservation protocol session because it would have provided specific functions that can combine multiple signals (analog or digital) for transmission over a common line or media over new Internet protocol being developed to enable the Internet to support Specified Qualities of Service."

First, there is no suggestion or motivation in the present invention or in the knowledge generally available to one of ordinary skill in the art that VoIP resource manager and admission control manager as disclosed by Lo can be combined with multiplexors and reservation protocol sessions as disclosed by Krishnaswamy to result in a system that discloses the limitations of claim 18.

Second, even if the teachings of Lo and Krishnaswamy are combined, the combination that results will be inoperable for the purpose intended by claim 18. By combining the teachings of Lo and Krishnaswamy, a multiplicity of individual RSVP sessions caused by the need for a RSVP session for each application will be multiplexed in a pipe with a bandwidth threshold. However, in the present invention, a common dynamic end-to-end QOS pipe is maintained between two different user communities using a preallocated RSVP session.

Third, even if the teachings of Lo and Krishnaswamy are combined they do not teach or suggest the following limitations of claim 18:

"a media multiplexor coupled to the admission control manager, the media multiplexor to tag media packets received from local application/endpoints that are associated with admitted application flows and to transmit the tagged media packets over the reservation protocol session;"

"a media demultiplexor to forward media packets received from remote application/endpoints to the local application/endpoints based upon tags appended by a media multiplexor of the one or more other media aggregation managers;" and

"a signaling gateway to perform signaling/media translation, if necessary, among a first signaling protocol employed by a first Voice over Internet Protocol (VoIP) environment in which the media aggregation manager is to operate and one or more signaling protocols employed by VoIP environments in which the one or more other media aggregation managers operate."

Applicant respectfully submits that there is no support in the section of Krishnaswamy or Lo relied upon by the Examiner, for the conclusion that Krishnawamy or Lo teach the media multiplexor tagging of media packets, and the signaling gateway in the recited elements of "… the multiplexor to tag media packets" and a "signaling gateway to …." respectively.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If, in the opinion of Examiner Nguyen, a telephone conference would expedite the prosecution of this application, Examiner Nguyen is requested to call the undersigned.

Respectfully submitted,

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